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THREE NEW SPECIES OF NEW GUINEA CULEX, SUBGENUS
LOPHOCERAOMYIA, WITH NOTES ON OTHER SPECIES

(DIPTERA, CULICIDAE)

By WILLARD V. KING¹ and HARRY HOOGSTRAAL²

The material herein described was collected by the writers and other members of the 19th Medical General Laboratory, U. S. Army, while stationed at Hollandia on the northern coast of Netherlands New Guinea during 1945. The collections contained a number of other undescribed species but, unfortunately, part of the material was spoiled by mold or lost in transit and naming of the species from the remaining specimens does not appear desirable. All of the material is deposited in the U. S. National Museum.

Culex (Lophoceraomyia) kuhnsi, new species

Male.—Head with a median triangular area of narrow-curved scales intermixed with upright forked scales, a patch of broad appressed scales on each side and extending as a line along eye margins. Proboscis dark, 1.2 times the length of fore femur. Palp just equal the length of the proboscis, without forked process at base; apical segment with only three bristles near tip; long segment with a row of short bristles below. Antenna (fig. 1a) with minutely pilose projection or prominence on inner surface of torus; segment 6 with six or seven slender bristles or bristle-like scales; segment 7 with a tuft of about 12 flattened scales; segment 8 with a group of about 8 short crumpled scales and 3 longer broader ones; segment 9 with about 10 bristles and a group of minute spines at base; segments 10 and 11 apparently without modified hairs. Scutum and scutellum with fine bronzy scales; pleura without scales; one lower mesepimeral bristle present. Wings with lateral scales of veins 2-4 long and narrow; forks of vein 2 almost 1.5 times as long as its petiole. Legs and abdominal tergites entirely dark scaled. Genitalia: Basistyle (fig. 1b) with an inner row of four bristles. Subapical lobe with a broad leaflet, a long stout bristle, several shorter setae, and

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a proximal group of three rods, two of which have hooked tips. Dististyle slightly curved, evenly tapered to tip; appendage attached subapically, long, angled at tip. Proctiger (fig. 1c) with a compact group of small bristles apically. Lateral plate of mesosome (fig. 1d) with a serrated margin, a spinose apical knob and a stout basal arm curved and tapered to a blunt point.

Female.—Palpi and antennae normal; scaling similar to male.

Larva (Fig. 1e).—Antenna straight, long with needle-like spicules on basal half of shaft; hair tuft arising three-fourths of distance from base, with about 20 branches. Preclypeal spines usually with one or two lateral spinules. Upper and lower head hairs (C and B) usually 3-branched, sometimes double, plumose. Thorax and abdomen densely pilose. Lateral comb of segment VIII consisting of a patch of from 35 to 45 elongate, fringed scales. Siphon slightly tapering from base and often very slightly curved just beyond middle, about 8 times as long as width at base; pecten of 14 to 19 teeth, the apical tooth or two somewhat removed from the others, each tooth with 3 or 4 large lateral denticles; three or four pairs of posterior hairs, 2- to 4-branched, each pair from 1 to 2 times as long as width of siphon at point of attachment. Anal segment completely ringed by a pilose plate, posterior margin with dense row of long thin spines; dorsal subcaudal hair with 3 or 4 unequal branches, ventral hair single; anal gills equal, slender, tapered to a point, about twice as long as saddle.

Types.—Holotype: ♂ (Lot 766C), reared from larvae from shaded tree hole in open coastal hillside woods, Doromena, Hollandia area, Netherlands New Guinea, February 28, 1945 (H. Hoogstraal and W. B. Christ, collectors). Paratypes: 9 ♂, 5 ♀, and 19 larvae, or exuviae, as follows: 2 ♂, 1 ♀ (428), reared from larvae from tree hole, rain forest, 250 feet elevation, Hollandia, December 15, 1944 (W. T. Nailon); 1 ♂ and associated larval skin (695-6), from shaded tree hole, sparse coastal forest just east of Nakasawa village, Hollandia area, February 12, 1945 (H. Hoogstraal); 1 larva (745) from tree hole at Doromena, February 25, 1945 (D. Johnson); 1 ♂ (763F) from larva from hole in coconut tree, Sapari (coastal) village, Hollandia area, February 26, 1945 (W. B. Christ); 2 ♂, 1 ♀, 5 larval exuviae (764) from larvae from hillside tree hole, Doromena village, February 27, 1945 (W. B. Christ); 1 ♂, 3 ♀, 5 larval exuviae (766C), same data as holotype; 2 ♂ and 2 larval exuviae (773), from larvae from large tree hole, Cyclops Mountains above Doromena village, elevation about 2,500 feet, March 1, 1945 (W. R. Fullem and H. Cook); 5 larvae (887), from fallen palm bracts, rain forest, elevation 250 feet, Hollandia, March 19, 1945 (H. Hoogstraal).

One ♂ and 1 ♀ (lot 346), from log hole, Hollandia, November 11, 1944, also identified as this species.

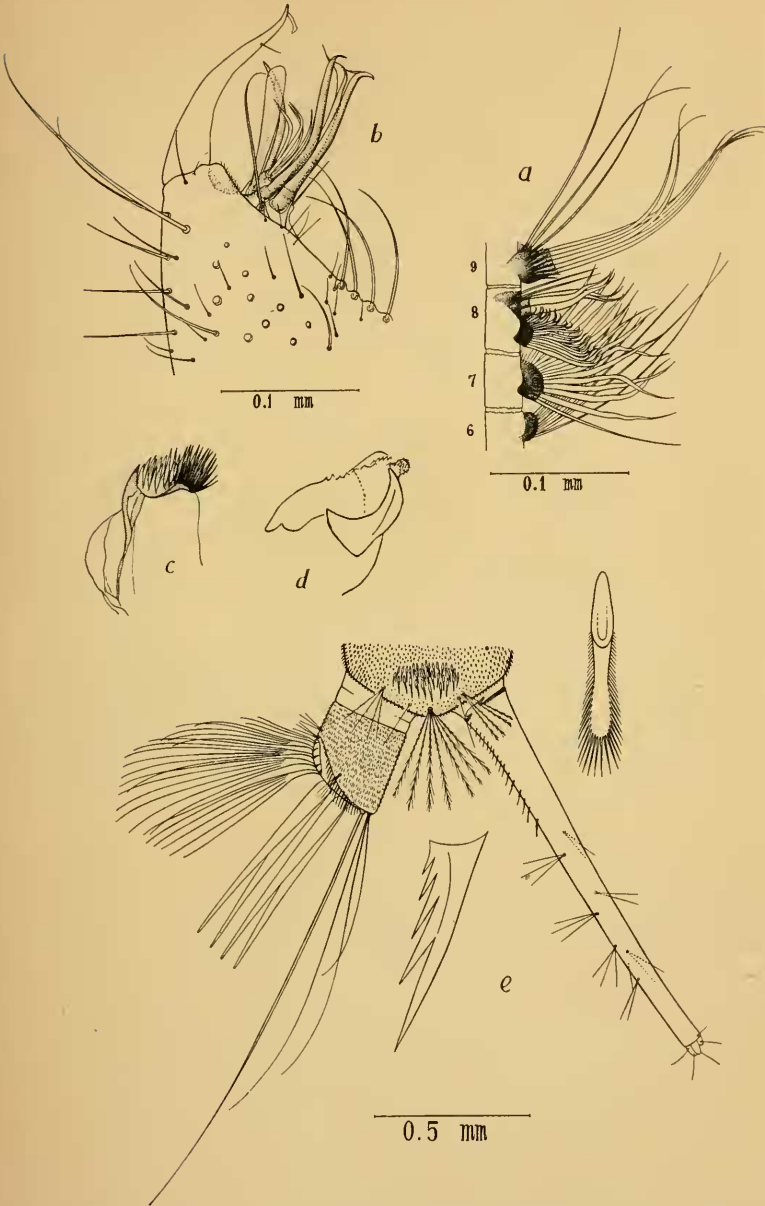


Fig. 1, *C. kuhnsi*, n. sp. :a, male antenna, segments 6-9; b, apical portion of basistyle; c, proetiger; d, lateral plate of mesosome; e, posterior segments of larva.

Almost all of the specimens came from tree holes in the light coastal woods near villages in the Hollandia area, though one collection was from 2,500 feet elevation. A single collection of five larvae was made from a palm bract in the rain forest at 250 feet elevation at Hollandia, and another from a tree hole in the same place. Breeding in association with this species were larvae of *Aedes* (*Stegomyia*) *albolineatus* (Theob.), *A.* (*Finlaya*) *notoscriptus* (Skuse), *A.* (*F.*) *hollandius* King and Hoogstraal, *Culex* (*Neoculex*) *brevipalpis* (Giles), *Tripteroides bimaculipes* (Theob.), and *Megarhinus splendens* (Wied.)

The species is named in honor of Dwight M. Kuhns, Colonel, Medical Corps, U. S. Army, Commanding Officer, 19th Medical General Laboratory.

This species belongs to the *mammilifer* group (group C) of Edwards because of inner projection on torus. It is closely related to *C. uniformis* Theob. of India because of the densely pilose larva, but differs in reduction of male antennal processes, much shorter male palpus, differences in number of sub-basal appendages of coxite as well as differences in shape of style, apical appendage of style, leaflet of subapical lobe, and the mesosome. It is closely related to *mindanaoensis* Baisas of the Philippines, with the types of which it was compared by the junior author. The lateral arm of mesosome (median process of Baisas), however, is quite different, being a smooth curved arm in *kuhnsi* but club-shaped and with serrated or toothed border in the Philippine species. The male palpus of *mindanaoensis* is slightly longer and segment 10 of the antenna has a few modified hairs.

Culex leei, new species

Male.—Head with broad appressed grayish scales, a median triangular patch of narrow curved scales not reaching eyes at vertex; palp slightly longer than proboscis, with forked process at base, the two apical segments with only a few bristles. Antenna (fig. 2a) without prominence on torus; segment 6 with a group of about 12 scales, the first 4 or 5 flattened but sharp-pointed and the rest somewhat longer, hair-like; segments 7 and 8 with the usual crumpled scales; segment 9 with about 7 flattened bristles; segment 10 with 2 flattened blade-like bristles terminating in a long slender tip; segment 11 with a group of 5 or 6 hair-like bristles. Scutum and scutellum with fine brownish scales; sternopleuron without scales; lower mesepimeral bristle present. Abdominal tergites uniformly dark scaled. Genitalia (fig. 2b): Basistyle with a row of 4 bristles on inner side; subapical lobe with 2 small leaflets, several short bristles and a proximal group of three stout rods, one unusually broad apically, the tips of all three somewhat hooked. Lateral plate of mesosome with a prominent slender arm, slightly curved,

and a small tooth on the plate near base of the arm; proctiger slender, straight, with several minute bristles subapically. Ninth tergite lobed, each with 7 or 8 bristles.

Female.—Similar in coloration to male; palpi and antennae normal.

Larva.—Very similar to other larvae in this group except for longer anal gills. Lower head hair 2-branched, upper hair 2- or 3-branched; lateral hairs of abdominal segments 3-5, mostly 4-branched; comb a patch of slender scales, evenly fringed around tip. Air tube about 8 x 1 with about 12 pecten teeth, fringed on one side to tip; four pairs of small hair tufts, usually 3-branched. Anal segment longer than wide, completely ringed; lateral hair small, 2-branched; dorsal sub-caudal hair with 1 long and 1 short branch, the lower hair long and single. Anal gills long, slender, about twice the length of the segment.

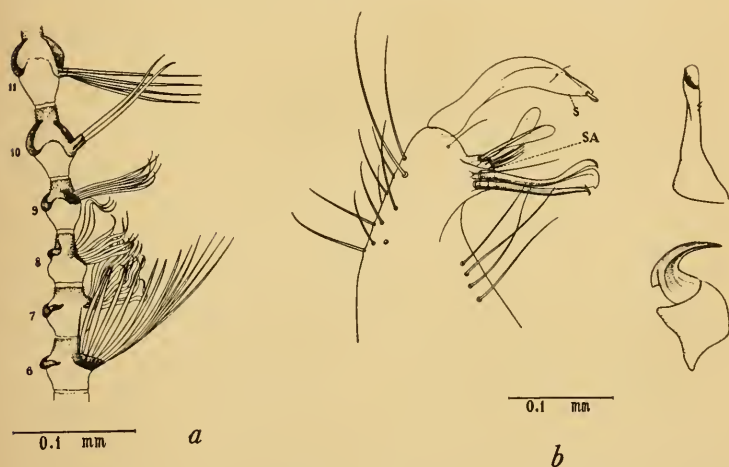


Fig. 2. *C. leei*, n. sp. : *a*, male antenna, segments 6-11; *b*, basistyle, proctiger, and lateral plate of mesosome.

Types.—Holotype: ♂ (1063-3), with slide mounts of genitalia, both antennae and larval and pupal skins; reared from larva collected from "Roseboom pond" near Pollimac road, Hollandia, Netherlands New Guinea, May 5, 1945 (H. Cook, collector). Paratypes: Two ♀, lot 1063-1 and -2, with associated slide mounts of larval skins, and one larval skin of 1063-5, same data as holotype; one ♂ lot 666 (now badly molded) with slide mount of whole head, and slide mount of genitalia and antenna of another male from same lot (rest of specimens lost), reared from larvae collected in a large log hole near Army hospital area, Hollandia, February 5, 1945 (G. L. Love).

This species belongs to the *fraudatrix* group but differs from other Oriental and Australasian species known to the writers by the combination of the characters of the male antennae and genitalia. *C. fraudatrix* differs in having the scales of the 6th segment much broader and bluntly rounded at tip, the lateral plate of the mesosome has a large second arm distally, somewhat knobbed at tip, and the proctiger has a smooth thumb-like tip beyond the row of bristles. *C. hilli* Edw. differs in having only 4 or 5 rather short scales, all except one of which are almost hair-like; the pleurae were said to have small patches of pale scales and the abdominal segments small basal lateral spots. *C. hilli buxtoni* Edw. was described as having 12 very narrow but blunt-ended scales on segment VI and 3 or 4 hair-like scales on segment X (versus sharp-pointed scales on VI and 2 blade-like scales on X).

The species is named in honor of Mr. T. G. Lee who has contributed much to the knowledge of Australasian Culicidae.

***Culex (Lophoceraomyia) marksae*, new species**

Male.—Head with broad appressed scales separated by a median triangular patch of narrow-curved scales extending nearly to eyes at vertex; palp with forked process at base; longer than proboscis by slightly more than the length of the apical segment; last two segments with numerous long bristles; long segment with a row of short bristles below. Torus without a prominence; segment 6 with a fan of about 15 long scales, an upper and lower group of broad, very dark, bluntly tipped scales separated by 3 to 5 narrower pale scales; segments 7 and 8 with the usual crumpled scales and segment 9 with a group of longer, curved scales; segment 10 with 3 stout bristles and 3 or 4 blade-shaped scales ending in a long slender tip; segment 11 with 2 long bristles. Scutum and scutellum with fine brownish scales; pleura unscaled; one lower mesepimeral bristle present. Abdominal tergites entirely dark scaled. Genitalia: Inner margin of basistyle (fig. 3a) with a row of 3 or 4 bristles; subapical lobe with 2 fairly broad leaflets, 2 small setae and a proximal group of 3 rods, 2 with hooked tips and the other very broad apically; lateral plate of mesosome (fig. 3b) with the usual large hooked arm; proctiger (fig. 3c) with a subapical row of small bristles or spines and extended distally into a stout, curved, bluntly pointed tip; lobes of 9th tergite (fig. 3d) each with 8 to 10 bristles.

Female and larva unknown.

Type.—Holotype: ♂, taken in light trap at edge of rain forest, elevation 250 feet, Hollandia, Netherlands New Guinea, April 23, 1945. King and Hoogstraal, collectors.

This species belongs to the *fraudatrix* group but differs from the other known members by the bicolorous fan on the 6th antennal segment, by the presence of two kinds of modified bristles on segment 10, and by the shape of the tip of

the proetiger which is more pointed and curved than in *fraudatrix*. From the latter it differs also in the absence of pale spots on the abdomen.

The species is named in honor of Dr. Elizabeth N. Marks who has added a great deal to the knowledge of Australasian Culicidae.

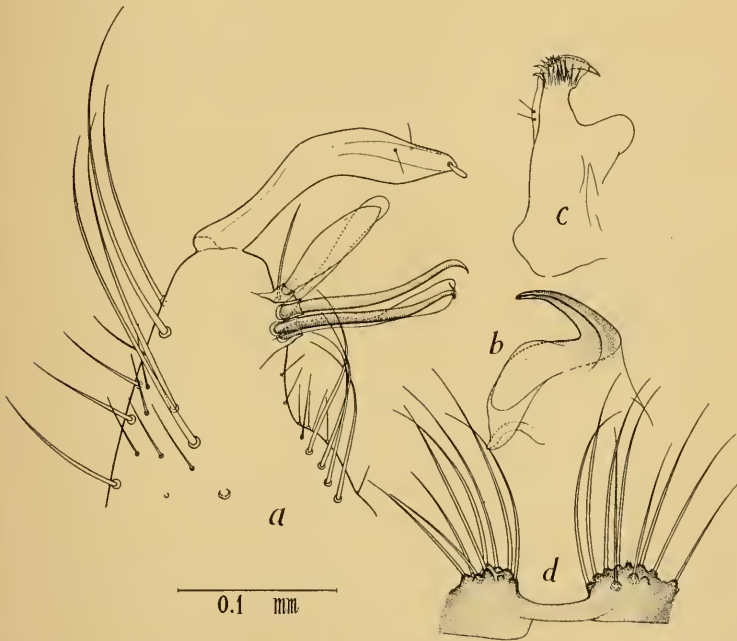


Fig. 3. *C. marksae*, n. sp. :a, basistyle; b, lateral plate of mesosome; c, proetiger; d, 9th tergite.

***Culex (Lophoceraomyia) ornatus* (Theobald)¹**

Melanoconion ornatus Theobald, 1905, Ann. Mus. Nat. Hung., 3:100.

Type female, Friedrich-Wilhelmshafen, New Guinea.

This species apparently has not been recognized since it was first described under the genus *Melanoconion*. Edwards (1924) stated, "The figure of the wing suggests a species of

¹Dr. Alan Stone has called our attention to the fact that this name is not a primary homonym of *Culex ornatus* Meigen 1818 since it was originally described in another genus and Meigen's species has been placed as a synonym of *Aedes geniculatus*. Under the rules adopted at Paris and Copenhagen no change in name is necessary.

the subgenus *Lophoceratomyia*." A fairly common species of this subgenus taken by us in the Hollandia area was identified as *ornatus* since the female characters agreed with Theobald's description. An excerpt is given below of Theobald's description of the female, followed by a description from our series of the male and larvae, which were previously unknown.

Female.—Head with small dusky curved scales, some dull yellowish ones in the middle, dusky gray flat ones at the sides, a few dusky and dull ochreous upright forked ones. Palpi and proboscis black. Thorax deep chestnut-brown with very small narrow-curved scales, two pale-scaled lines on the posterior half running down to the scutellum, golden scales at the sides in front of the wings and extending to the head and some golden scales in front. Scutellum brown with pale creamy narrow-curved scales. Pleura brown with yellowish tinge. Abdomen with basal creamy lateral spots which on some segments nearly meet to form indistinct basal bands. Legs deep brown, ungues small, equal and simple. Wings with brown scales, fork-cells short, the first submarginal with dense thick scales, also the first longitudinal and to same extent the third long vein. Described from a single female.

Unmentioned in the original description is the presence of a lower mesepimeral bristle and a row of pale scales along the upper and posterior margins of the sternopleuron. In our series the pale-scaled lines on the posterior half of the scutum are usually not very definite.

Male.—Similar to female except as follows: palp longer than proboscis by length of apical segment; last two segments turned sharply upwards, with a dense row on each side of long, dark bristles; a hairy, forked process at base of palp. Antenna (fig. 4a) strongly plumose, without a prominence on torus; segment 6 with a large fan consisting of 18 or more long scales, the upper two thirds of which are dark, broad, and broadly rounded apically, the remaining scales being narrow, more pointed, and paler in color, especially basally; segment 7 with a short wavy tuft and 3 longer pointed scales, segment 8 with a short matted tuft and with 3 or 4 longer scales which are bowed at right angles distally, segment 9 with a tuft of 5 long, subapically curved hairs; segment 10 with 5 long, thickened hairs and 6 blade-like scales with narrow apical prolongations along one side; segment 11 with about 6 long, dark, slightly curved thickened hairs. Genitalia: Ninth tergite with shoulders bearing a few weak setae. Proetiger (fig. 4c) with a rounded, smooth tip and a single row of small graduated spines subapically; mesosome (fig. 4d) consisting of a pair of curved, flattened plates tapered to a narrowly rounded tip, a narrow sharp retrorse projection on the distal border, a row of small spines near base on outer border. Basistyle (fig. 4b) about twice as long as mid width, outer surfaces clothed with fine spicules and short and medium long setae; inner margin with a row of five strong setae. Subapical lobe prominent,

with 11 appendages which fall into three groups, the proximal group consisting of 3 heavy, curved rods with enlarged hooked tips and a single stout seta, the second group with a large leaf-like spine, 2 smaller, flattened spines, and 2 setae, the third group a single large leaflet and a single seta. Dististyle three-fourths as long as coxite, curved nearly at right angles, broadest at apical third and tapered to a narrowly rounded tip, a pair of short hairs at apical fourth and a row of very short hairs between this pair and apex on outer surface; claw attached slightly before tip, short, rounded.

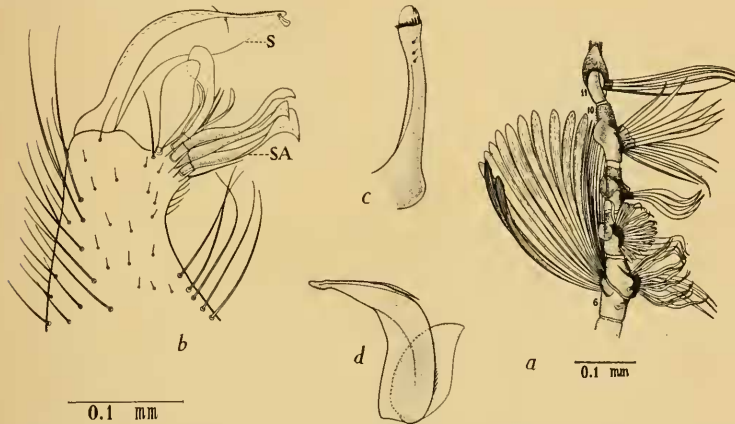


Fig. 4, *C. ornatus* (Theob.) : a, male, antenna, segments 6-11; b, basistyle; c, proetiger; d, lateral plate of mesosome.

Larva.—Antenna about as long as head, straight, narrow, with numerous spicules between base and hair tuft; hair tuft arising almost three-fourths distance from base, multibranching. Pre-clypeal spines about one-fifth as long as antennae, moderately thickened. Upper and lower head hairs usually 2-branched, the upper sometimes 3-branched on one side. Thorax covered with fine spicules, upper meso- and metathoracic pleural hair tufts long, with 5 to 8 plumose branches. Upper lateral hairs of abdominal segments I to IV with 2 or 3 branches, segment V with 3 or 4 branches. Segment VIII with lateral comb of from 34 to 46 narrow, elongate, fringed scales. Siphon long and narrow, widening slightly at tip; ratio 6 or 7 x 1; prominent acus present; from 9 to 14 pecten teeth on basal third, each with a fringe of denticles along the entire length of one side; four or five pairs of single to 3-branched ventro-lateral hair tufts on apical three-fourths, not longer than width of siphon. Anal segment elongate, cylindrical, completely encircled by saddle; saddle with minute spicules posteriorly; lateral hair 3-branched; dorsal sub-caudal hair with 3 branches, ventral one single; anal gills equal, about as long as saddle, strongly tapered to a narrow, rounded point apically.

The rich, dark bronzy brown scales on the scutum, especially dense over the fossae and lateral surfaces, are distinctive among the New Guinea *Culex*. The pale scales along upper and posterior borders of sternopleuron and the large lateral abdominal spots extending at least a short distance onto dorsum and usually forming nearly a complete band are also distinctive. The large fan of scales on the sixth antennal segment is similar to that of *C. fraudatrix*.

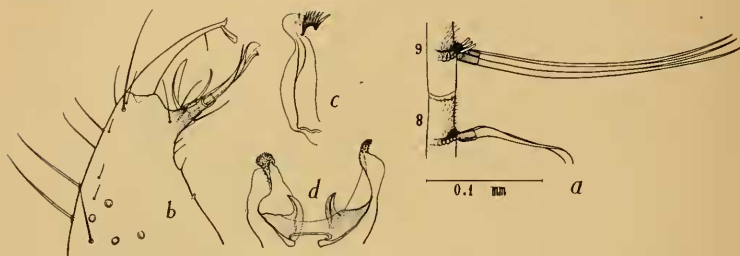


Fig. 5. *C. digocentensis* Brug: a, male antenna, segments 8 and 9; b, basistyle; c, proctiger; d, mesosome.

The larva is similar to that of *C. fraudatrix* from which it can be separated by the spiculated thorax. Living specimens of *ornatus* larvae could be distinguished from those of *fraudatrix* by the larger size, uniformly darker color (one abdominal segment not pale as often noted in *fraudatrix*), and by the absence of the dark siphonal band usual in *fraudatrix*.

Adults of this species were frequently encountered in the Hollandia area but larvae were seldom taken. Twenty-two larvae, from which 10 males and 8 females were reared, were taken from a deep hole, completely shaded by grass, in the laboratory clearing in March 1945 along with larvae of *Aedes* (*Aedimorphus*) *alboscuteclatus* (Theobald), *Culex* (*Culicomyia*) *pullus* (Theob.), *C. (Lutzia) halifaxi* (Theob.) and *Uranotaenia* sp. The previous day two larvae were taken from a partly sunlit, muddy, leaf-filled seepage pool at the edge of a sago swamp, along with *Culex pullus* and *Uranotaenia* sp. In February several larvae were taken in the hoof print of a boar in a dark sago swamp. On several occasions between December 1944 and February 1945 males and females were taken by various members of the laboratory resting among the buttresses of large trees deep in the rain forest. Two females were taken "while attempting to bite," one in the afternoon in the rain forest and one in a tent early in the evening. A light trap operated for 115 nights between January and June 1945 at the edge of the rain forest yielded 85

♂ and 138 ♀, while another operated for 76 nights during the same period in the large laboratory clearing yielded 19 ♂ and 52 ♀ specimens.

Culex (Lophoceraomyia) digoelensis Brug

Culex (Lophoceraomyia) digoelensis Brug, 1932, Bull. Ent. Res. 23: 81-82. Female and male described from Upper Digoel River, South New Guinea.

This species was described as having the pleurae all black, abdomen and legs with dark brown scales only, male palpi about one-third longer than the length of the proboscis, and the antennal ornamentation as in *C. (L.) infantulus* Edwards, 1921. The description of the genitalia was as follows: "Hypopygium differing from that of *C. (L.) infantulus* as described by Edwards (Ind. J. Med. Res., X, 1921, p. 287) by having tubercular, not spinose, lobes on the mesosome, with rounded tips; moreover the 10th sternite has no membranous projection, but one stout spine, three smaller but well developed spines and three minor spines; the bases of the lobes of the mesosome with a medially directed hook." In the original brief description of *infantulus*, however, Edwards stated that the mesosome had a tubercular surface so it appears that Brug must have intended to say that *digoelensis* had spinose, not tubercular, lobes. A specimen collected by us in a light trap at Hollandia on January 19, 1945, has a rounded spinose apex on the lateral plate of the mesosome and in view of the above supposition was identified as *digoelensis* since the other characters agree with Brug's brief description. Segment 8 of the antenna has two short bristles, and segment 9 three long bristles closely appressed, which agree with Edward's description of *infantulus*. Drawings of the antennal and genitalic characters of our specimens are shown in fig. 5, since illustrations of the species have not previously been published.

ADDITIONAL DATA ON SABETHINI

(DIPTERA, CULICIDAE)

BY J. LANE¹ and O. R. CAUSEY²

When we had the opportunity of studying a collection of Sabethini made in Passos, State of Minas Gerais, Brazil, during the years 1946 to 1949, hitherto undescribed males, pupae, and larvae of five known species were encountered. These are described in the present paper. The material on

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